BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Regulations to Track and Mitigate Emissions from Petroleum Refineries Regulation 12, Rules 15 and 16

Public Workshop
March 2015

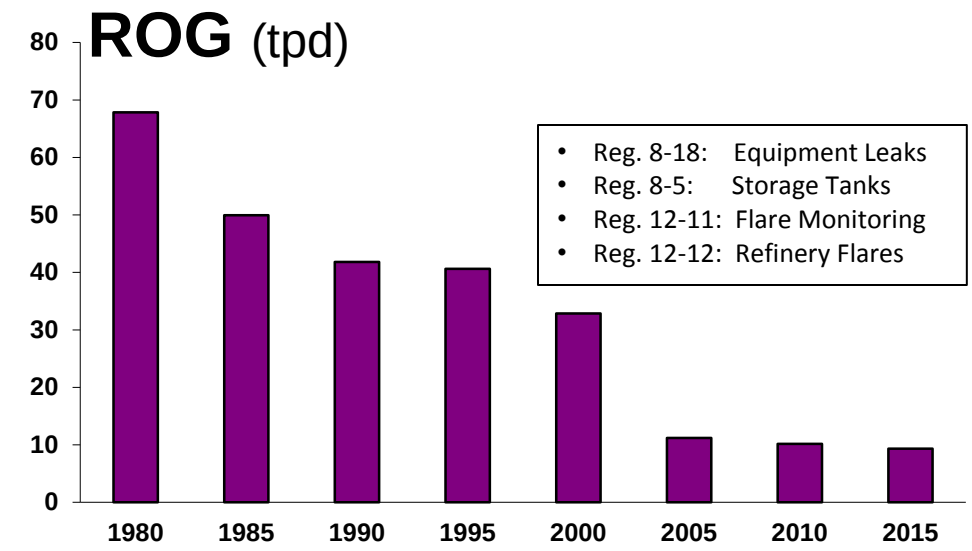
The Bay Area Air Quality Management District (Air District)

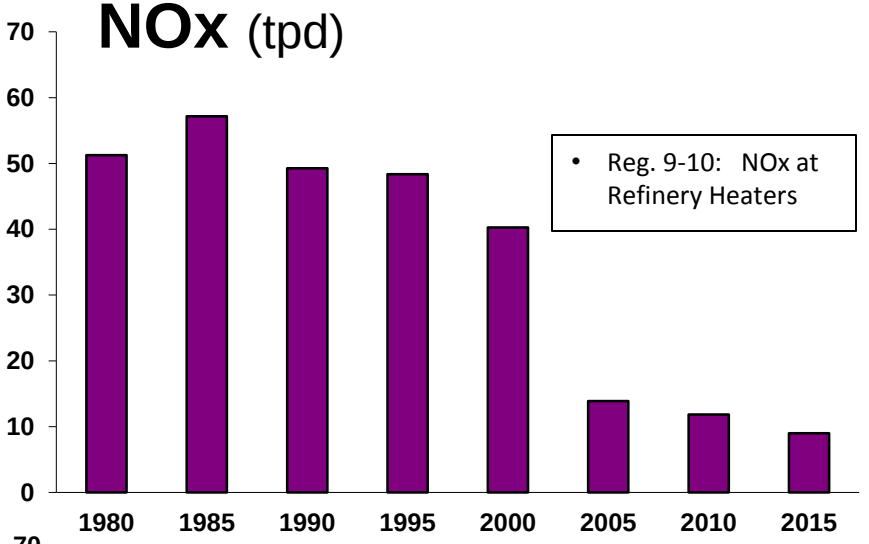
- Established in 1955
- 100+ cities
- 7 million people
- 5 million vehicles
- Mission: To protect and improve public health, air quality, and the global climate

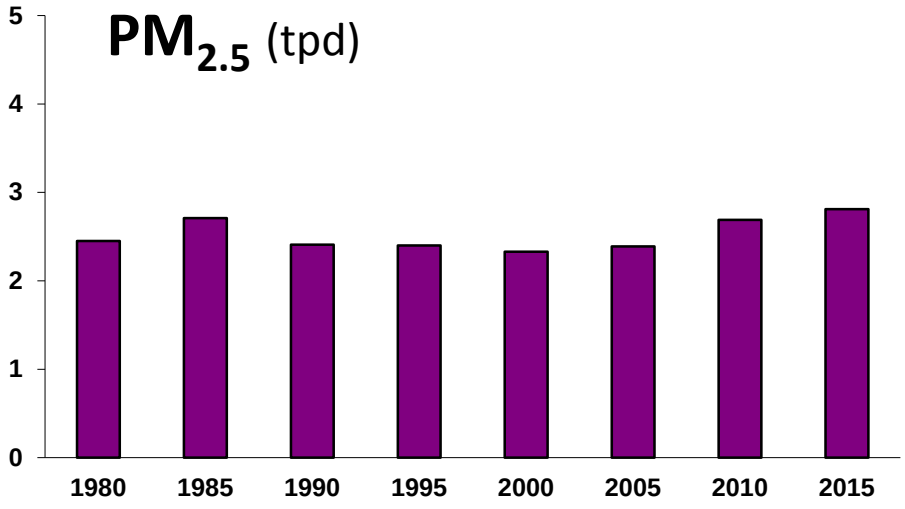
Background

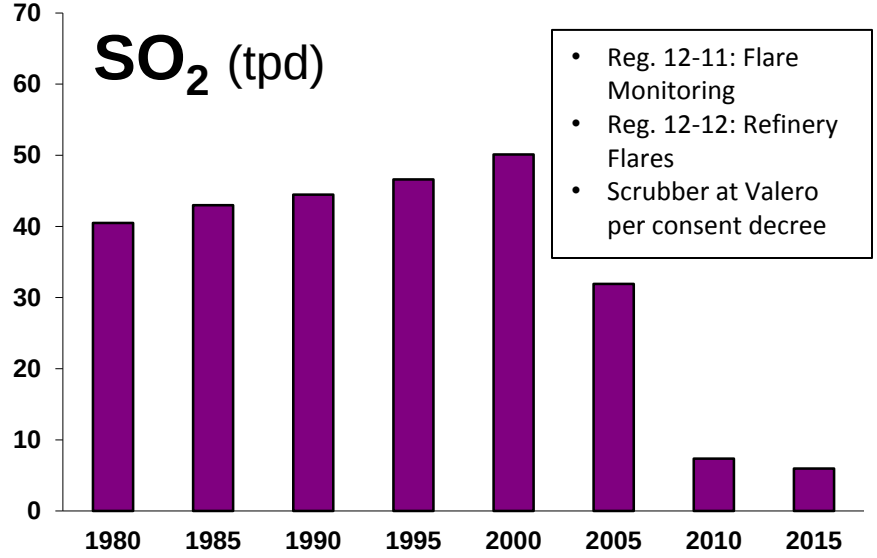
- Resolution 2014-07 directed staff to reduce emissions from refineries -
  - Develop Regulation 12, Rule 15 to track refinery emissions
  - Develop Regulation 12, Rule 16 to require mitigation of emission increases at refineries
  - Develop new rules and amend existing rules to achieve 20% reductions in emissions and associated health risks within five years

Refinery Emission Trends 1980-2015 and Main Causes of Reductions









Air District Refinery Regulations

REGULATION 1 - GENERAL PROVISIONS
REGULATION 2 - PERMITS
REGULATION 6 - PARTICULATE MATTER AND VISIBLE EMISSIONS
REGULATION 7 - ODOROUS SUBSTANCES
REGULATION 8 - ORGANIC COMPOUNDS:

- Rule 1 - General Provisions
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REGULATION 9 - INORGANIC GASEOUS POLLUTANTS:

- Rule 1 - Sulfur Dioxide
- Rule 2 - Hydrogen Sulfide
- Rule 3 - Nitrogen Oxides from Heat Transfer Operations
- Rule 7 - Nitrogen Oxides And Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, And Process Heaters
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REGULATION 10 - STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES: This Regulation establishes emission and/or performance standards for new plants and other sources by reference to the provisions of Part 60, Chapter 1, Title 40, of the Code of Federal Regulations.

REGULATION 11 - HAZARDOUS POLLUTANTS

- Rule 1 - Lead
- Rule 2 - Asbestos Demolition, Renovation and Manufacturing
- Rule 7 - Benzene
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- Rule 12 - National Emission Standard For Benzene Emissions From Benzene Transfer Operations and Benzene Waste Operations

REGULATION 12 - MISCELLANEOUS STANDARDS OF PERFORMANCE:

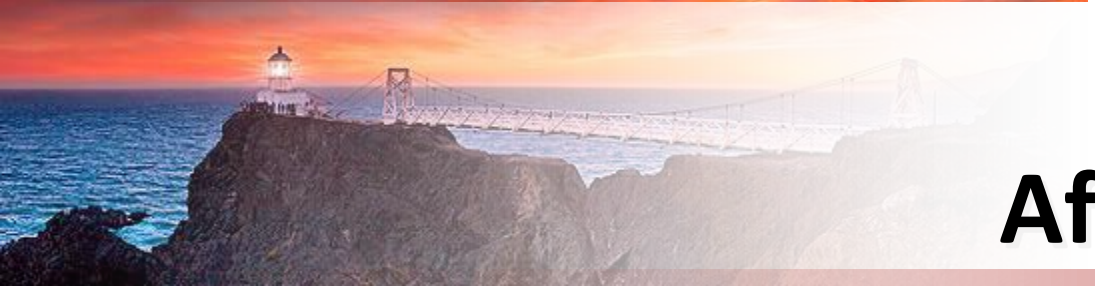
- Rule 11 – Flare Monitoring
- Rule 12 – Flare Control

Board Actions Requiring Emissions Reductions at Refineries 1992-2013

Date	Reg.-Rule	Description	Pollutant
3/92, 1/98, 11/02, 1/04	8-18	Equipment leaks at refineries	ROG
3/92	8-22, 8-25	Leaks from valves and flanges	ROG
1/93, 12/99, 10/06	8-5	Storage tanks	ROG
1/94, 12/10, 10/13	9-10	Boilers, steam generators, process heaters	NO_X
12/97, 3/98, 12/05	8-28	Leaks from pressure relief valves	ROG
6/03	12-11	Refinery flare monitoring	All
1/04	8-10	Process vessel depressurization	ROG
9/04	8-8	Refinery wastewater separators	ROG
7/05, 4/06	12-12	Refinery flares	All
12/05	8-44	Marine loading operations	ROG
7/07	9-8	Stationary internal combustion engines	NOx, PM
4/09	8-33, 8-39	Gasoline bulk terminals	ROG
4/12	8-53	Vacuum trucks	ROG

Additional Rule Development to Reduce Refinery Emissions

Project	Expected Benefits	Status
Tracking and monitoring refinery emissions	Improved protection of public health, identification of control opportunities	Workshops scheduled for March
Mitigating emissions increases at refineries	Ensure refinery emissions continue to decrease	Workshops scheduled for March
Reduce SO_2 from coke calcining	Reduce SO_2 emissions	Workshop planned for April or May
Reduce ammonia from Fluid Catalytic Cracking Units	Reduce ammonia emissions in order to minimize PM formation	Concept paper to be published in April
Further reduce equipment leaks (pumps, valves, other)	Reduce ROG and toxic emissions	Concept paper to be published in April
Limit sulfur content of refinery fuel gas	Reduce SO_2 emissions at some refineries	Concept paper to be published in April
Reduce SO_2 from acid plants associated with refineries	Reduce SO_2 emissions	Concept paper to be published in April
Cooling tower monitoring and repair	Reduce ROG and toxic emissions due to leaking heat exchangers	Concept paper to be published in April



Other Rules Affecting Refineries

- Regulation 2, Rule 5 – New Source Review of Toxic Air Contaminants
- Regulation 6, Rule 1 – General Particulate Matter
- Regulation 9, Rule 9 – Stationary Gas Turbines

Regulatory Approach

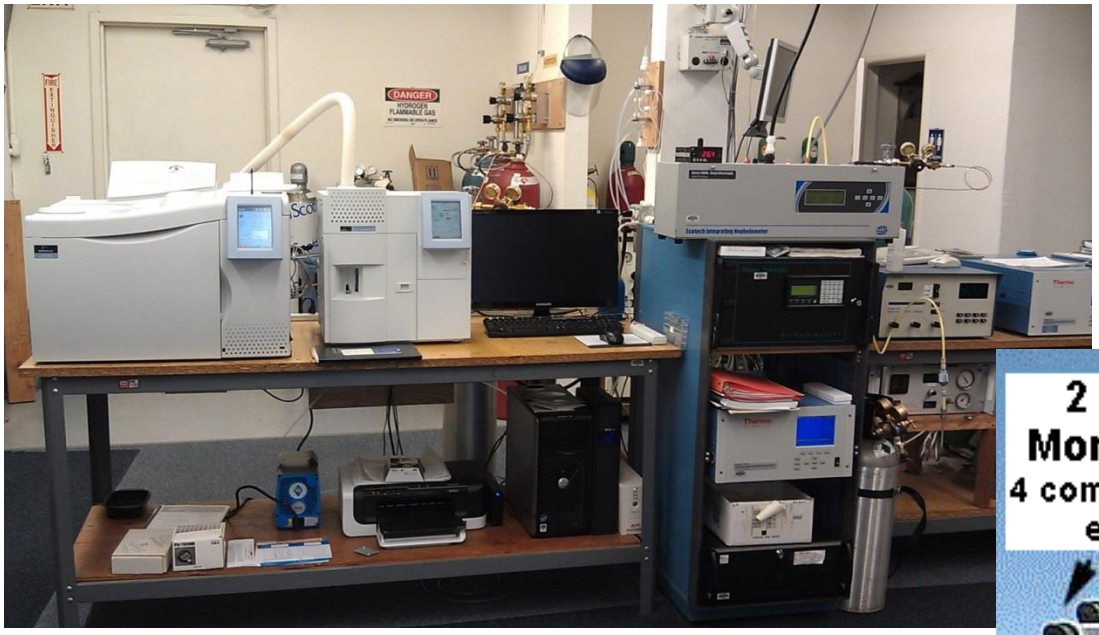
- Regulation 12, Rule 15 (12-15) – Petroleum Refining Emissions Tracking Rule

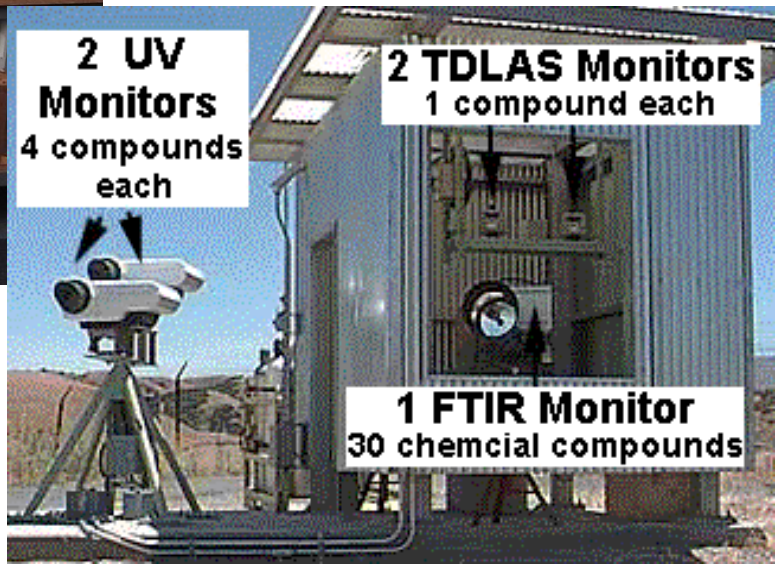
- Regulation 12, Rule 16 (12-16) – Petroleum Refining Emissions Analysis, Thresholds and Mitigation Rule

12-15 Elements

- ***Annual emissions inventories*** of all regulated air pollutants based on upgraded methods, including emissions from cargo carriers
- ***Petroleum Refinery Emissions Profile (PREP)***; require that on-going inventories include comparisons with PREP
- ***Crude oil composition characteristics*** with annual emissions inventories (e.g. sulfur, nitrogen content, API gravity, Total Acid Number)
- ***Health Risk Assessments (HRA)*** with enhanced emissions inventories and revised OEHHA HRA guidelines
- ***Enhance fence line monitoring systems and establish community air quality monitoring systems***

Air Monitoring Systems





Goals of 12-16

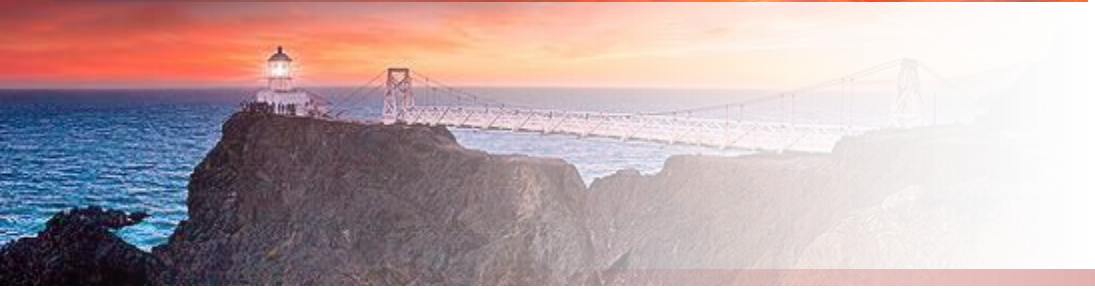
- Identify emissions increases of criteria pollutants, Toxic Air Contaminants (TAC) and greenhouse gases (GHG) based on PREP
  - Determine cause/source of emissions increases
  - Identify ways to mitigate TAC and criteria pollutants increases
  - Ensure public participation
- This will help ensure that crude oil composition changes do not increase emissions
- This will help identify processes that contribute to emissions increases

Elements of 12-16

- ***Causal Analysis*** of criteria pollutants, GHG and TACs if trigger levels are exceeded
- ***Mitigation plan*** to bring criteria pollutants and TACs below trigger levels within two years (plan available for public review)
- ***Identification of Control Technology (Audit***) of all sources if reductions not achievable within two years to identify potential to further reduce emissions
- ***Updates to mitigation plan*** if proposed progress is not made within two year window
- ***Health Risk Assessments (HRA)*** updates if risk increases above trigger levels

Issues Raised

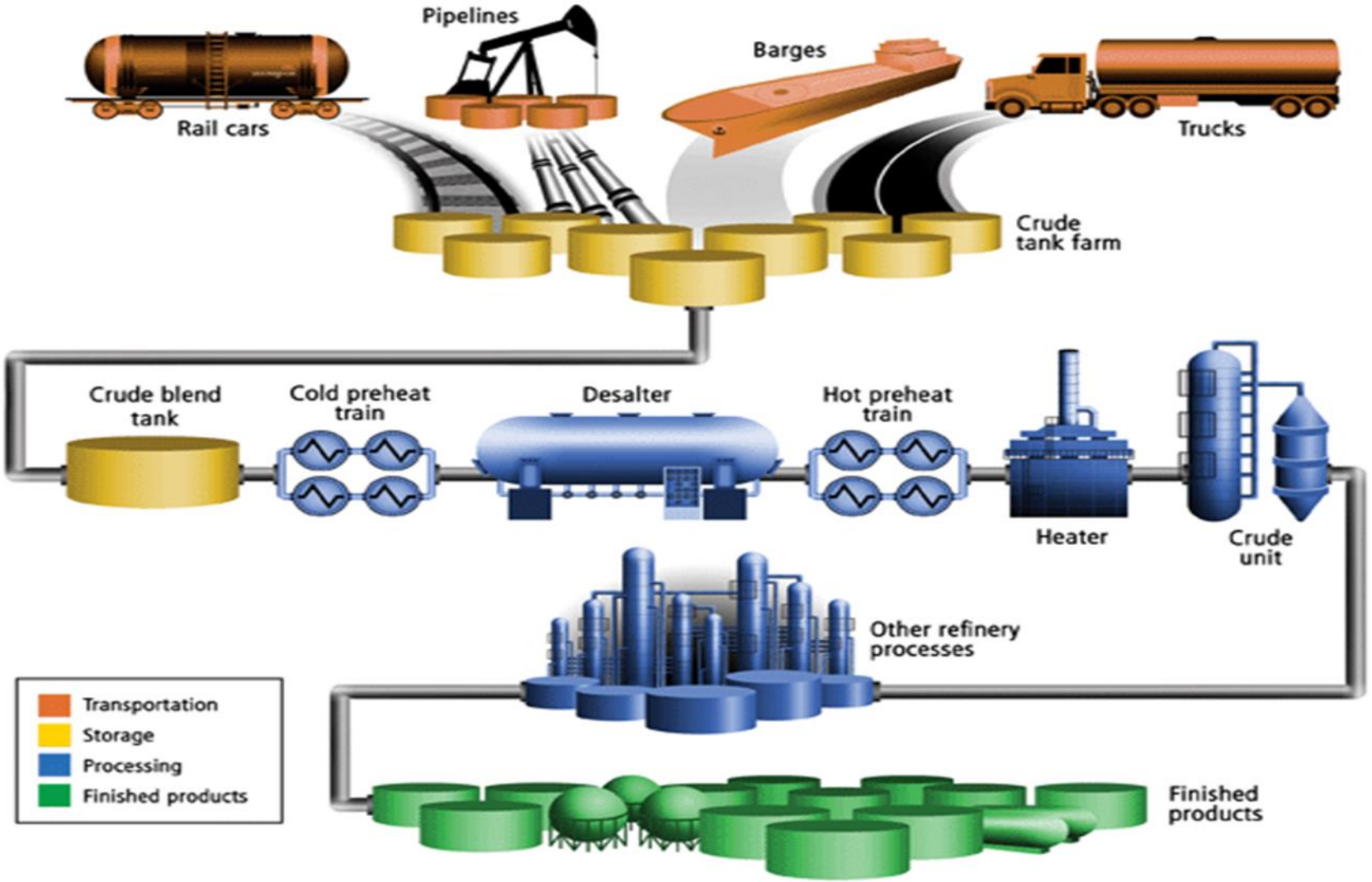
- Community stakeholders have made comments on Regulation 12-16 regarding the following areas:
  - GHG emissions
  - Permitting moratorium
  - Crude oil throughput



Next Steps

- Hold public workshops for 12-15 and 12-16
  - Benicia, Martinez, Richmond and San Francisco during the week of March 16th
  - San Francisco workshop will be webcast
- Consider comments and make changes to draft rule
- Complete staff report, including responses to comments and analysis of socioeconomic and environmental impacts
- Present 12-15 and 12-16 to Board for consideration and potential adoption in the 2nd quarter of 2015

Refinery Overview



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Cutting Edge Regulations

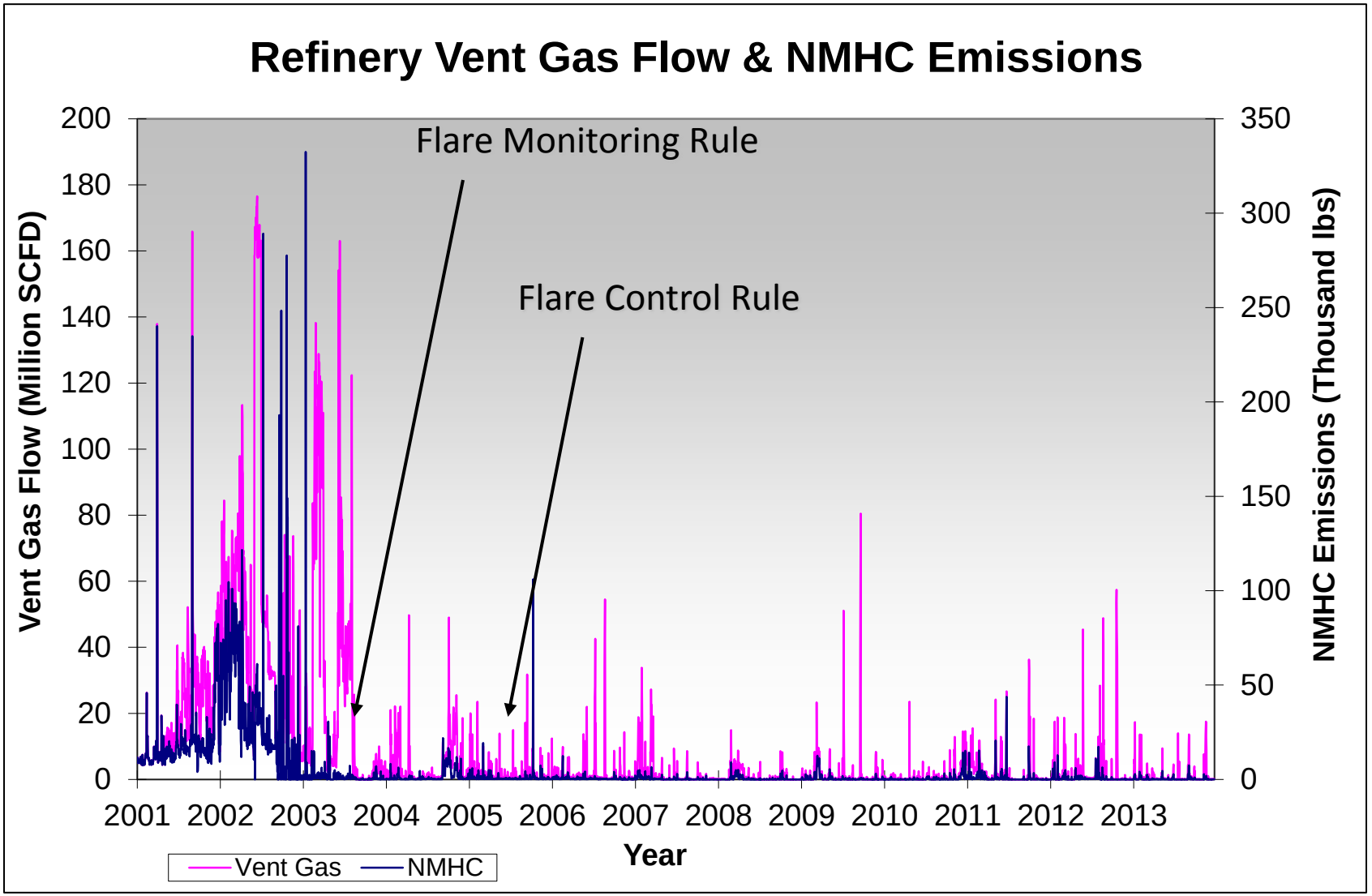
Fugitive Emissions:

- 100 parts per million leak standard
- First regulation to control Greenhouse Gases (methane)
- South Coast AQMD and EPA at 500 ppm
- Collaboration between Communities, Environmental Groups and Industry

Other Regulation Examples

- Tanks, Marine Loading and Flares

Flare Volume and Non-Methane Hydrocarbon Trends



Air District Compliance & Enforcement Efforts- 2014

- **Compliance Verification Inspections**
  - 12,132
- **Complaint Investigations**
  - 5448
- **Violations**
  - 648
- **Incident Investigations**
  - 404
- **Compliance Audits & Refinery Program Review**
  - Tank Degas Audit
  - Regulation 8-18 Audit
  - Marine Terminals Audit

Questions/Comments

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